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REPORT TO THE CITY OF B O S T O N AUDITORIUM COMMISSION

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A C O N V E N T I O N A N D E X H I B I T I O N
H A L L I N B O S T O N

F I N A L R E P O R T T O
C I T Y O F B O S T O N
A U D I T O R I U M C O M M I S S I O N
V O L. 1

August 6, 1958

C-61431

Arthur D. Little, Inc.

32 MEMORIAL DRIVE, CAMBRIDGE 40, MASS.

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We wish to acknowledge the valuable contributions to this work by our architectural consultants, Shepley Bulfinch Richardson and Abbott, of Boston, and by George A. Fuller Company, General Contractors.

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Arthur D. Little, Inc.

ESTABLISHED 1886



THIRTY MEMORIAL DRIVE
CAMBRIDGE 42, MASSACHUSETTS

August 6, 1958

City of Boston Auditorium Commission
79 Beacon Street
Boston, Massachusetts

Attention: Mr. Glenwood J. Sherrard, Chairman

Gentlemen:

C-61431

This is our final report to the City of Boston Auditorium Commission.

In response to an oral request by Mayor Hynes, we are presenting herewith our findings and recommendations to date. Our supplementary report covering the potential market to be served by the convention and exhibition hall and our recommended management policies for such a building will be submitted by October 15, 1958.

The project, with its time limitations, has been a challenging one. We appreciate the opportunity of having worked with you.

Respectfully submitted,

Arthur D. Little, Inc.

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I. S U M M A R Y

A. PURPOSE AND SCOPE

The purpose of this report is to present the conclusions derived from these three phases of our work:

1. Identification of the facilities needed in the auditorium and exhibition hall to serve meeting and exhibition functions.
2. Allocation of gross area within the building for the major meeting and exhibition functions to be accommodated.
3. Suggestion of features which would be desirable but not necessary within the building.

Our supplementary report on October 15, 1958 will include material on the remaining two phases:

1. A listing of the potential users of the convention and exhibition hall and the estimated frequency of use.
2. Recommendations for general management policies for a convention and exhibition hall.

B. CONCLUSIONS AND RECOMMENDATIONS

1. Potential users of the building have an extremely varied demand for number, type and size of meeting and exhibition spaces.

Therefore, space within the building cannot be allocated arbitrarily on a permanent basis if a substantial portion of the market is to be satisfied.

2. Many potential users cannot occupy the entire building by themselves.

Therefore, to maximize return on investment will require provision for simultaneous occupancy by more than one group.

THEREFORE, WE RECOMMEND A TOTALLY FLEXIBLE BUILDING, WHICH CAN BE ACHIEVED THROUGH THE USE OF MOVABLE WALLS AND PARTITIONS

II. I N T R O D U C T I O N

The City of Boston intends to construct a \$10 million convention and exhibition hall at the corner of Boylston and Dalton Streets in the Prudential Center.

On May 7, 1958, the Boston Auditorium Commission asked us to undertake a program of research designed to assist it in determining the type of building to construct and the nature of the facilities to be provided. We were requested to consider a building that could be built on the site within a budget of \$10 million. The architectural design of the building and the costs of acquiring and developing the land and of financing the construction were excluded from our study. The Commission also asked us not to explore the use of the building for competitive sports events, for musical or theatrical performances, or for other functions adequately served by buildings already existing in Boston. The Commission further asked us to assume that the Mechanics Building would no longer be available.

Time being of the essence, we were requested to present our report not later than September 15, 1958, even though this placed some limitation on the depth to which our studies could be carried.

Because of events beyond the control of either the City or the Auditorium Commission, this tight schedule had to be further compressed, and on July 23, 1958, we were requested to summarize our then existing data and report our findings and recommendations on August 6, 1958. This we have agreed to do, but in so doing feel that qualifications of our conclusions must be carefully stated to avoid misunderstanding.

As the study was originally conceived, we were expected to rely on data already in our files, on our professional judgment, and on other available data necessary to support our conclusions. To ensure the utmost statistical reliability we planned a research program which would validate and update the general data already accumulated, as well as augment it where necessary.

The market research and other data-collecting activities were to be carried out in successive stages, each involving the interviewing of carefully selected respondents to a different depth, in order that the maximum statistical reliability might be achieved in the shortest period of time.

We planned approximately 250 personal and telephone interviews with individuals responsible for the management of all trade shows, conventions, and consumer exhibitions who could use the proposed facility, and with other persons competent in this field. In addition, we expected to contact any interested parties in Boston as well as those public agencies which could supply us with necessary information. The interview list was compiled from our own files, and those of the Convention and Visitors Bureau of the Greater Boston Chamber of Commerce, the International Association of Convention Bureaus, and from other competent sources.

At the time of the request of July 23 to present as complete a report as possible on August 6, data were available from the earlier part of the research and were partly tabulated. These data provided us with detailed information concerning the facilities requirements and other principal characteristics of organizations in the country which might be attracted to the new hall. Among organizations thus interviewed, 53 indicated their intention to come to Boston, and we determined that they could be served by the type of facility which might be constructed within the given budget on the given site. We must caution that the ratio thus far between the number of organizations interviewed and the number which said they would come to Boston cannot be relied on as indicative of the ultimate market because the groups contacted to date are not representative of the total market potential.

At the time of the Mayor's request for an accelerated report, we had also compiled data on six consumer exhibitions who indicated a desire to use the new convention and exhibition hall. As in the case of the organization survey, the size of this group should not be relied on to indicate the acceptability of the facility for

consumer exhibits generally, because the interview program has not been completed. We have not had time to draw together data from approximately 140 smaller organizations and shows; until this work has been completed these represent an unknown and indeterminate potential for the proposed hall. However, the research completed to date does permit a statistical validation of the material in our files concerning general facilities requirements for organizations of all types and sizes.

Thus, the report which follows covers the three phases of our work which could be completed satisfactorily, although not ideally, by August 6. A supplementary report on the remaining two phases is to be submitted on October 15, 1958. Until our market research is complete, of course, we cannot reliably estimate how many groups might actually use the structure in Boston. Nevertheless, we believe that our conclusions and findings to date are substantially supported, through both evidence and our own experience. We have carefully avoided reporting findings or drawing conclusions in those areas where either our data or our judgment prevents us from presenting a sound and valid discussion.

III. C R I T E R I A F O R S P A C E

A L L O C A T I O N S A N D

S E L E C T I O N O F F A C I L I T I E S

A. POTENTIAL USERS OF BUILDING

Users of the proposed convention and exhibition hall will consist principally of national, regional and local trade shows, consumer exhibitions, and conventions which cannot be housed adequately in existing facilities.

Trade shows, whether held separately or in conjunction with a convention, are typically designed to appeal to a particular profession or industry. They are organized by a professional promoter or by the management of a convention. The exhibitors purchase space in the show and display products of interest to the persons admitted. Although the method varies, the standard practice is to display products and other items in exhibit booths which are 10 feet square and which are arranged in a symmetrical pattern within the building, back to back, with a 10 foot aisle between facing exhibits. Examples of trade shows include the Air Conditioning and Refrigeration Institute, the American Hospital Association, and the Automotive Accessories Association of America.

It has been our experience that if the facilities are adequate, trade shows and conventions prefer to meet and exhibit in the hotel or hotels where the delegates are housed. Very few large shows may be so accommodated anywhere in the country, and certainly none can be accommodated in Boston under prevailing circumstances.

While trade shows are typically restricted to convention delegates or other persons with an official interest in the products displayed, consumer exhibitions are designed to attract the general public, and an admission is generally charged. Usually initiated by a promoter, they carry a single theme. Examples of consumer exhibitions are The Foreign Car Show, The New England Flower Show, and The New England Boat Show.

Because we have not been asked to explore a market already served adequately in Boston, we have directed our attention to those organizations whose normal requirements are too large to be

Table I

P R I N C I P A L E X I S T I N G C O N V E N T I O N A N D
E X H I B I T I O N F A C I L I T I E S I N B O S T O N

<u>Halls</u>	<u>Maximum Seating of Main Hall (Persons)</u>	<u>Gross Area Available for Exhibit Purposes Square Feet</u>	<u>Small Meeting Rooms No.</u>	<u>Capacity (Persons)</u>
Boston Arena	7200 ¹	20,000		
First Corps of Cadets Armory	3000 ¹	15,000	1	60
Horticultural Hall	1000	7,543	2	150-275
Symphony Hall	2631	9,300		

Hotels

Statler Hilton	1520	20,129	23	20-100
Bradford Hotel	2400	15,720	11	30-650
Sheraton Plaza	1150	13,235	4	60-250

1. Maximum fixed by fire regulations.

Source: Arthur D. Little, Inc., Personal Interview Survey, July, 1958.

served by existing facilities and which could be housed in the proposed building on the proposed site.

Table I lists the major facilities now available in Boston for the trade show, consumer exhibition and convention market. As the table shows, no one facility available for conventions and exhibitions will provide in excess of 20,000 square feet of gross exhibition space or facilities seating more than 7,200 people. In making this statement we are aware that the Commonwealth Armory contains 78,500 square feet of space. However, we are told by Major General Harrison of the Military Division of the Commonwealth of Massachusetts that because of military commitments, this facility should not be considered generally available for convention and commercial exhibition purposes. Similarly, a full calendar of regularly scheduled events excludes the Boston Garden from normal use as a convention and exhibition facility.

In order not to duplicate existing facilities it would appear that the proposed convention and exhibition hall should be designed and planned to serve organizations whose smallest meeting involves (1) more than 7,200 persons, or (2) whose exhibit space requirements are more than 20,000 square feet, or (3) whose other special needs - such as a number of smaller meeting rooms - make demands which cannot be met in existing Boston facilities. This principle, if accepted, will set the minimum limit for planning.

What are reasonable maximum limits for planning?

We were asked to consider a building which might be constructed for a given budget and upon a given site. We then had to determine the general size and type of structure which might be built, so that we could eliminate from consideration those organizations whose requirements were greater than the new facility could satisfy.

We asked our architectural consultants -- Shepley Bulfinch Richardson and Abbott, and our construction consultant, George A. Fuller Company -- to undertake a brief study so as to advise us on the general size and type of exhibition and convention hall which might be built within a budget of \$10

Table II

MAXIMUM PLEDGED HOTEL ROOMS
FOR CONVENTION USE - BOSTON¹

<u>Hotel</u>	<u>Pledged Rooms</u>
Ambassador	20
Avery	40
Beaconsfield	35
Bellevue	150
Bostonian	65
Bradford	250
Braemore	51
Broadway	22
Canterbury	25
Commander	50
Continental	96
Copley Square	102
Essex	260
Fensgate	40
Gardner	36
Hampton Court	22
Huntington	32
Kenmore	160
Lenox	141
Lincolnshire	50
Manger	375
Minerva	31
Parker House	406
Peter Bent	10
Ritz Carlton	50
Sheraton Plaza	325
Sherry Biltmore	99
Somerset	250
Statler	900
Terrace Motel Apts.	8
Touraine	175
1200 Beacon St. Motel	55
University Club	40
Vendome	110

Total Pledged Rooms 4481 ²

1. This does not include the proposed new hotel in the Prudential Center which might be expected to pledge 500-700 rooms.
2. During busy seasons the total number of pledged room is reduced to about 3500.

Source: Convention and Tourist Bureau, Greater Boston Chamber of Commerce, July 11, 1958.

million on the given site in the Prudential Center. We feel that these estimates concerning building size, which are presented below, are reasonable, given the information available at the time of the study.

Within a \$10 million budget on the given site in the Prudential Center, a convention and exhibition hall with a total gross area of approximately 280,000 square feet is possible. Of this, it appears that an uninterrupted, continuous space of 115,000 square feet on one floor is feasible, after allowance of 15,000 square feet for auxiliary spaces such as lobbies, offices, and registration areas.

In addition to this, some 150,000 square feet of the total gross area could be provided at other levels, within the budget.

Architectural estimates of gross rentable area range from 60% to 70% of gross area. If 65% is a reasonable compromise, then 182,000 gross square feet of area will be available for use by exhibitions and conventions for all purposes.

There is another determinant of the maximum limit for planning: The number of hotel rooms that a city can pledge for use by a convention governs the largest groups in their selection of a city. Table II lists the maximum number of pledged hotel rooms in Boston. Groups requiring a larger number of hotel rooms must be excluded from consideration.

Thus, the maximum limits for planning are set.

We find that the total potential market for a convention and exhibition hall in the Boston area consists of approximately 250 groups.

At the time we were asked to summarize our findings to date and report our conclusions, we had assembled data on approximately 25% of these groups. As indicated, we have been able to tabulate and analyze these data and augment it with data in our files and with judgments based on our experience. The data tabulated to date are based principally on the responses of the largest groups which might use the Boston

facility. It is our experience that facilities which can accommodate these groups are also acceptable to somewhat smaller groups. Therefore, we are presenting our recommendations for facilities and allocation of meeting and exhibition space on the basis of the data assembled thus far, together with our previous experience.

It should be noted that our recommendations are not based on a mathematical averaging of data given to us by all respondents. Some of our recommendations are the maximum needs reported by a relatively few organizations. Because of the desirability of attracting certain key groups, we feel, on balance, that the cost of providing these facilities is justified. On the other hand, the expressed desires of many groups for certain facilities turned out, after analysis, to be clearly ideals rather than requirements. The history of these organizations indicates that they have never refused buildings that have not provided these facilities. As before, we have weighed the importance of the request against the cost and other considerations and made our recommendations accordingly. Where we have not been able to rely solely on our data and judgment, we have been guided by the experience and responses of others competent in this field. We believe that if the facilities, requirements and space allocations which we recommend are satisfied, the convention and exhibition building to be erected in Boston will meet the needs of the needs of the potential market.

B. SPACE REQUIREMENTS

1. Variety of Demand The data we have tabulated to date indicate an extremely varied demand for sizes and types of meeting rooms. With meeting facilities constructed according to an inflexible pattern, it would be very difficult to satisfy a large portion of the market. This fact is supported by our experience in previous studies.

We have also discovered a distinctly varied requirement for total meeting space: several groups need no meeting space at all, whereas one requires a high of 172,000 square feet. There have been very few firm demands for unusual seating arrangements or unusual facility requirements for meeting rooms.

There have been very limited requests for fixed seating among the groups interviewed to date. The total exhibit space requirements vary as widely as those for meeting space. But, whereas there is an almost infinitely varied requirement for sizes and types of meeting rooms, there is an almost universal desire that all exhibit space be in one large room. In the questionnaires tabulated to date our respondents have requested exhibit space varying from 0 to 150,000 square feet. From these responses we have found that many groups with large exhibit requirements have nominal meeting room requirements and that large users of meeting space generally require nominal exhibit space.

It is clear to us that space within a convention and exhibition hall cannot be allocated arbitrarily on a permanent basis if a substantial portion of the market is to be satisfied. The allocation of any space strictly for auditorium purposes will limit the number of groups which might use the building for exhibit purposes, and a building designed strictly for exhibits cannot successfully attract a large number of groups to whom meeting space in varied quantities is essential.

Provision for simultaneous usage of the building is imperative. As we have indicated, our tabulations to date represent information chiefly concerning large organizations which might be expected to use the Boston convention and exhibit hall. Most of these groups would be large enough to rent and occupy the entire building. Data in our files indicate, however, that there are somewhat smaller groups which cannot be adequately served by existing convention facilities but which could not afford to occupy the entire new building. Provision must, therefore, be made for simultaneous occupancy of the building by two or more such groups if maximum return on investment is to be achieved. In our judgment such groups can be attracted to the new facility only if completely independent access and circulation within the building are possible for all groups using it simultaneously.

The problem, therefore, is to construct a building that can provide interchangeable spaces to meet these varied demands.

In order to clarify the discussion we shall describe the essential characteristics of meeting rooms and exhibition spaces.

2. Meeting Space Characteristics The arrangement of the meeting space required varies according to the groups concerned but falls under four major headings:
 - a. Large Audiences require a theater-like arrangement with a sloping floor, a well-equipped stage with no obstructions in the line of view, suitable acoustics and lighting, a film projection room and screen, and appropriate interior finishing.
 - b. Large Assemblies of delegates of an organization may require an arrangement of chairs and desks on the floor of the hall so that individual sub-groups may be segregated. There must be a raised platform for the executive groups. A host of microphones, appropriate acoustics, and a high intensity of lighting are essential. The non-delegate members attending these meetings are ideally accommodated in a balcony.
 - c. Religious or Fraternal groups who hold services or elaborate pageants require a broad, deep stage that can hold an elaborate set, and a large flat floor upon which seats can be arranged in a variety of ways so that there is adequate space for ceremonial processions. The maximum use of the building for seating is required for these groups.
 - d. A Number of Small Rooms of varying size with proportional ceiling heights is required by a large part of the market. Those with excessively large requirements in both number and capacity of rooms may also have to make use of available meeting spaces in surrounding buildings. Table III lists alternative meeting spaces in the general vicinity of the convention and exhibition hall.

Table IIIA U X I L I A R Y M E E T I N G S P A C E S(E X C L U D I N G H O T E L S)

<u>Facility</u>	<u>Seating Capacity</u>
Dorothy Quincy Suite	800
John Hancock Hall	1100
Jordan Hall	1019
New England Mutual Hall	913
Falmouth Hall	520

Source: Arthur D. Little, Inc.
 Personal Interview Survey, July, 1958.

3. Exhibit Space Characteristics Exhibitions require a large uninterrupted area, ideally so large that even the most extensive exhibitions need not be broken down into different rooms or placed at several levels. The area should be free of columns, have a high ceiling, and be designed to carry heavy floor loads. Utility outlets should be available at regular intervals so that temporary lines to booths are not a hazard. The space should be so arranged as to allow the greatest flexibility in the layout of the exhibits and to permit its most efficient utilization.

C. PROBLEM
 RESOLUTION-
 FLEXIBILITY

Obviously, areas designed exclusively for auditorium functions are largely unsuitable for exhibit functions, and areas designed exclusively for exhibit functions are largely unsuitable for meeting functions. One solution would be to build the right number of rooms of each kind to meet the requirements of every user. The variations in demand are so wide, however, that such a solution would represent an inadmissibly extravagant use of land and funds. Clearly then, some resolution is necessary. It can be achieved through a building which will permit the interchangeability of meeting rooms and exhibit spaces of various sizes. We have discussed this matter

with our architectural consultants, Shepley Bulfinch Richardson and Abbott, and believe that a building of this type can be constructed on the aforesaid site within the existing budget.

While it is true that a building designed for multiple purposes can never fully meet the ideal specifications for each particular kind of space, we are convinced that this solution will most satisfactorily meet all but the most rigorous requirements of all the users that can be physically accommodated within the building.

D. CHARACTER- ISTICS OF A FLEXIBLE BUILDING

The essential characteristic of a building which can achieve interchangeability is that its volumes can be sub-divided by movable walls and partitions into rooms of various size and function. There must be a major volume which can be divided into a few large rooms, and lesser volumes for division into many small rooms. Conversely, the whole area of the building can be used for a single or multiple purpose.

1. Spaces The major volume should be a large level space free of columns; it should have a high ceiling, and at one end a stage of suitable proportions. There should be additional level space contiguous with the major volume -- also free of columns, but with a lower ceiling. Part of this minor volume should be an extension of the floor area of the major volume and another part should adjoin it at a second level and serve as a balcony.
2. Movable Walls The movable walls, made up of panels, would be suspended from overhead tracks based on a grid related to the structural members of the building and its ceiling heights. Guides at the floor level would hold them in line vertically. Such walls would be used to sub-divide the main hall and the low-ceiling areas. Smaller walls would be used to divide the balcony and under-balcony areas from the main hall.

Wherever possible, the movable walls should be hand operated. Storage space for them should be provided in recesses along the walls;

they would thus be protected when not in use, and wall surfaces would be flush. Movable panels should be small enough to be handled by two men. The joints should be soundproof. Doors should be provided for circulation purposes.

While it is not possible to provide complete insulation from the transmission of sound between adjacent areas separated by such partitions, proper construction should effectively control noise up to 40 decibels. The sound of normal functions in one room should not reach the next room. If higher noise levels were expected, meetings could be scheduled in non-adjacent areas.

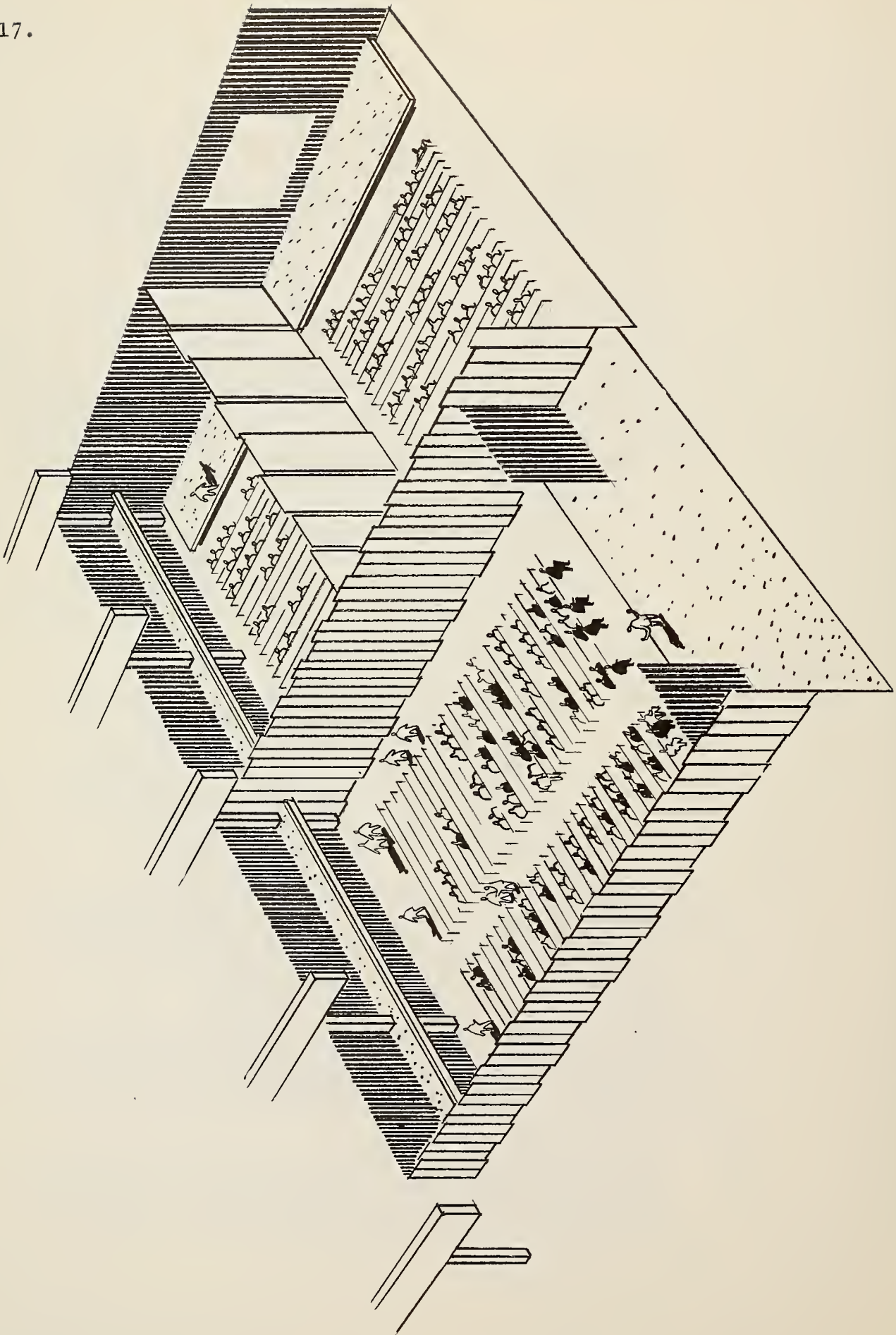
3. Seating As we have said, our market research shown no significant demand for a fixed-seat auditorium in the proposed facility. On the contrary, our survey indicates that a variety of seating arrangements is essential. These may be summarized as follows:

1. Comfortable seats on a sloping floor.
2. A conference-room arrangement, with the seating around the table.
3. Seats arranged around a horseshoe-shaped table for large discussions.
4. Various arrangements of desks and chairs for working meetings.
5. Tables and chairs for banquets.

All these arrangements can be provided for our architectural consultants have told us that there are satisfactory systems for the facile installation and removal of temporary sloping floors.

The accompanying sketches illustrate some of the combinations of room size and kind of space made possible within one building through the use of movable walls and temporary sloping floors.

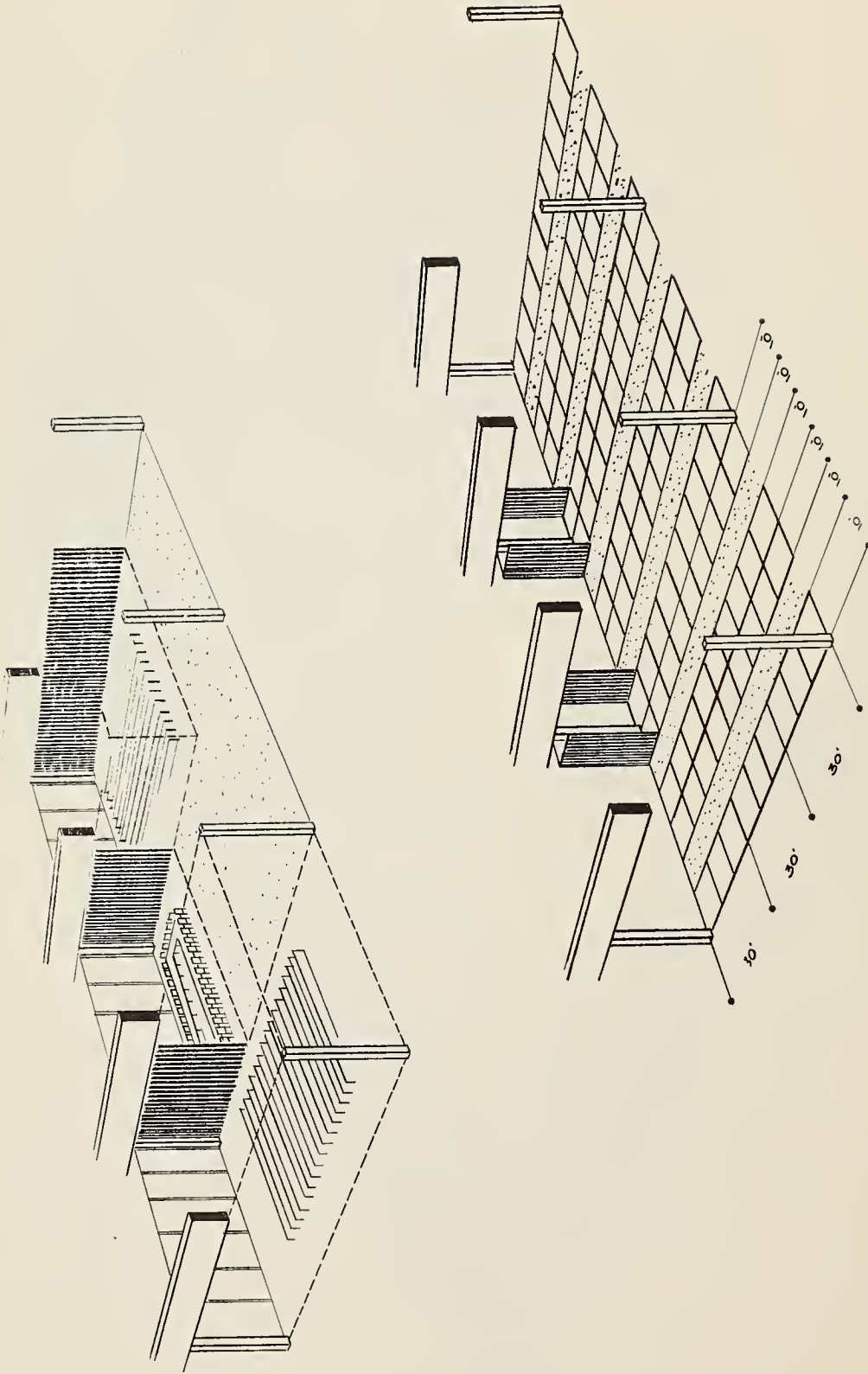
These diagrams seek to show certain characteristics of volume and structure that are required in order to achieve a high degree of flexibility. They are not designs for a building,



THE SAME SPACE, SUBDIVIDED BY THE MOVABLE WALLS, IS BEING USED BY THREE MEDIUM SIZED MEETINGS.

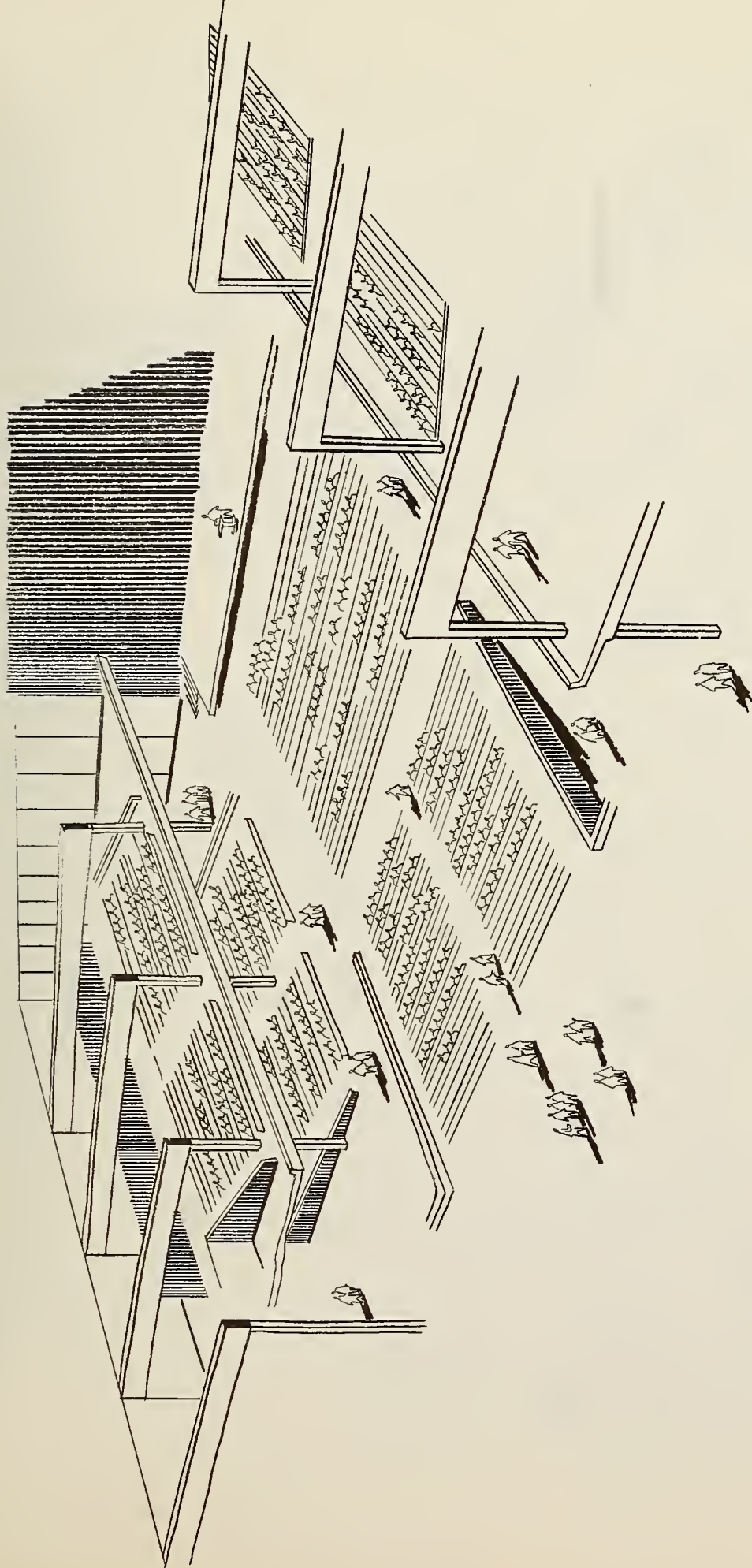
but simply express a functional concept for the flexible allocation of space. This concept can be incorporated into a variety of architectural solutions.

4. Simultaneous Use With this great flexibility, it is obvious that provisions can be made for a wide range of requirements for one user. By the same token, the building can be used simultaneously by more than one convention or exhibition. If more than one group is using the building at the same time, each must have its own entrance, lobby, and circulation so that it can be kept entirely separate from the others.

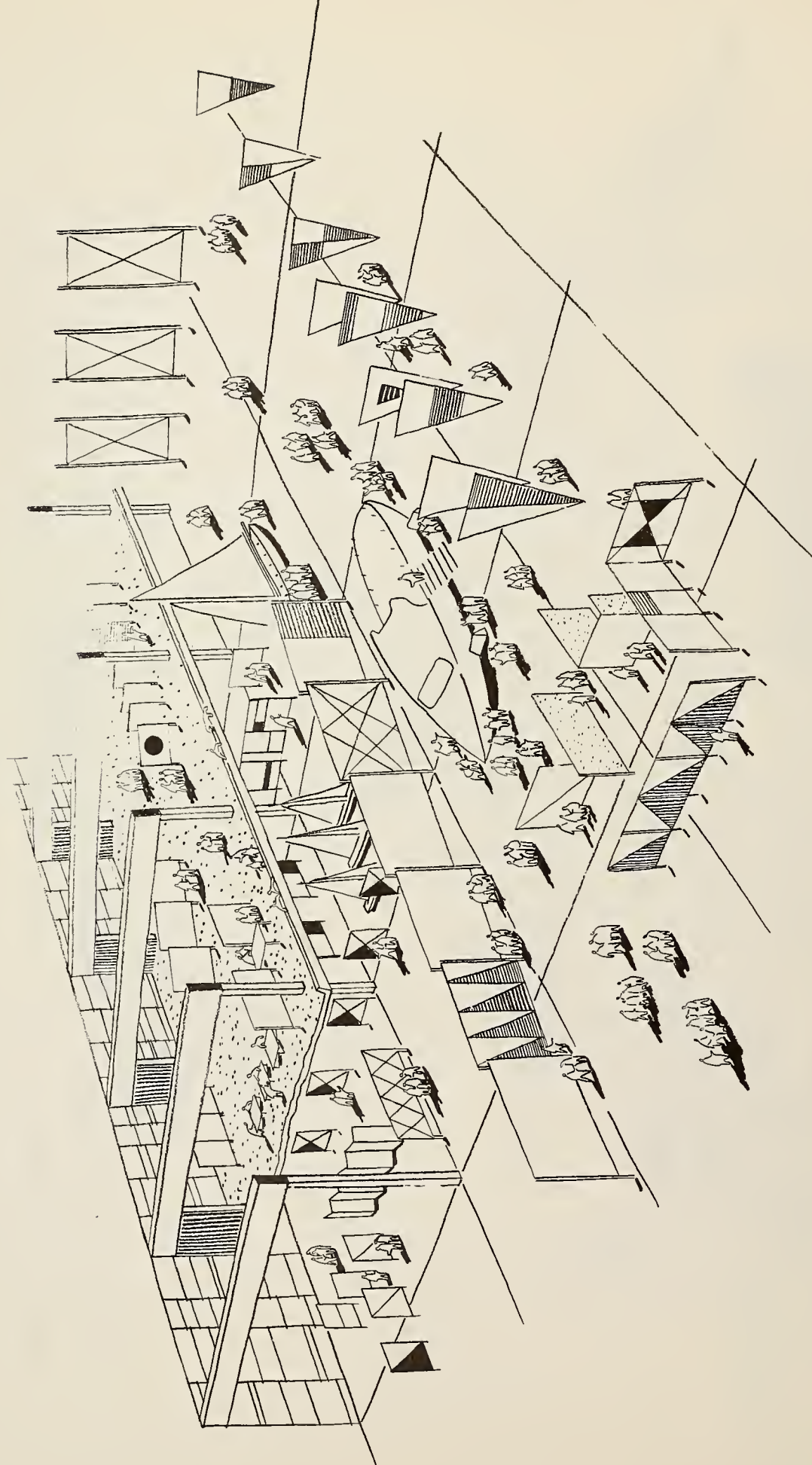


ABOVE: THE LOW-CEILING AREA (EITHER BALCONY OR UNDER-BALCONY) IS DIVIDED INTO THREE MEETING ROOMS OF VARYING SIZES.

BELOW: THE SAME AREA, TRANSFORMED INTO ONE LARGE ROOM, IS BEING USED FOR A SMALL EXHIBITION. THE LAYOUT OF STANDARD 10' X 10' BOOTHS IS INDICATED ON THE FLOOR.



FOR VERY LARGE MEETINGS OR STAGE PAGEANTS, THE FIRST LEVEL OF THE LARGE SPACE AND THE BALCONY ARE BROUGHT INTO USE. TEMPORARY SLOPED FLOORS AND SEATING ARE USED. WITH THIS ARRANGEMENT ABOUT 10,000 PEOPLE COULD BE SEATED.



WITH ALL THE PARTITIONS FOLDED BACK, THE ENTIRE SPACE CAN BE THROWN OPEN FOR USE AS A
LARGE, UNINTERRUPTED EXHIBITION SPACE.

IV. C O N V E N T I O N A N D
E X H I B I T I O N H A L L
F A C I L I T I E S

A. RECOMMENDED
FACILITIES

Gross rentable space is defined as the total area enclosed within the walls of an exhibition room. Net rentable space is defined as only that area actually occupied by exhibitors' booths; it discounts all circulation and other service spaces. Quite naturally, the prime objective in designing an exhibition layout is to achieve the maximum utilization of space in order to derive the highest income.

In an exhibition hall, the most efficient unit arrangement consists of a double row of booths -- back to back, and flanked on each side by an aisle -- and a single row of booths against the two side walls. In a small area, the net rentable space is thus 60% of the gross exhibit area. In a very large area, this ideal 60% efficiency is reduced by exits, transverse aisles, and other necessary service areas and obstructions.

The standard booth size is 10 feet x 10 feet and the usual aisle is 10 feet wide. While this is an accepted standard, several variations are commonly used. Other booths are multiples of 10 feet in width and are 8, 12, 14, or 16 feet in depth. Aisles may range from 8 to 12 feet.

In view of these considerations, it is of prime importance that spans, column spacing, the location of movable partitions, and utility outlets be designed upon these criteria rather than on a purely structural basis.

1. Columns Inevitably some columns will be necessary. It is mandatory that they be centered on multiples of 10 feet throughout the exhibit space. We recommend that the long spans be 30 feet or multiples thereof.
2. Ceilings The ceiling in the large space should be at least 50 feet high. In the balcony there should be 30 foot clearances, and in the under-balcony area there should be 20 foot clearances.

3. Floor Loads The main floor should be designed to support live loads of 300 pounds per square foot. The balcony should be designed for live loads of 250 pounds per square foot. Wherever vehicles are to drive on the floor, the limits should be increased by 100 pounds per square foot.
4. Utility Outlets Since utility outlets should be immediately available at each booth, they are subject to the locational criteria we have described. There are several systems in use, but we recommend that a module be used throughout the usable area. Utilities should be readily accessible at any point in the grid. If a trough covered with removable panels is used, a minimum length of cable, hose, or pipe is exposed above the level of the floor. Complete utilities should also be available at the stage.

Utilities that should be provided are as follows:

<u>Type of Utility</u>	<u>Outlets</u>
Electricity	
110 volts AC	Each booth
220 volts AC ¹	Each booth
440 volts AC	Approximately one third of booths
550 volts AC	Approximately 15 booths
DC	Approximately 15 booths
PBX Telephones	Each booth
Water, Hot	Approximately one third of booths
Water, Cold	Approximately one third of booths
Drainage	Approximately one third of booths
Compressed Air	Approximately one third of booths
Gas	Approximately one third of booths
Steam	Approximately 15 booths
Exhaust	Approximately 15 booths
Vacuum	Approximately 15 booths

5. Storage Space Storage space for exhibitor's crates during an exhibition period should be equivalent to approximately 20% of the gross exhibit area. In addition, storage area is required for temporary seating or flooring not in use. Storage space is ideally located on each level of the exhibition areas.

1. (single and three-phase)

6. Auxiliary Spaces

- a. Shipping and Loading It is of fundamental importance to provide means whereby a large exhibit can be moved in and set up in the shortest possible time. There are several approaches to the solution of this problem:
 - (1.) Provide direct truck access to the exhibition area by ramps from the street level. (In the winter, dirt can be removed mechanically from truck wheels and chassis.)
 - (2.) Unload trucks at an unloading dock, transporting the goods to the destination on wheeled pallets or fork-lift trucks. If this system is used, there should be accommodations for simultaneous unloading of at least 12 trucks.
 - (3.) When several levels are to be serviced, elevators may have to be used; they should be large enough to carry a semi-trailer. When elevators are the sole means of ingress and egress, however, they often cause congestion.

It would be very desirable to have at least two freight-receiving areas for those occasions when the building is being used for more than one function. There should be a small freight-receiving office at each entrance for control purposes.

All ramps, doorways, and entrances to storage areas should have at least a 20 foot clearance and should be wide enough to accommodate semi-trailers.

In any case, there must be enough space to avoid congestion on the street, at the point of unloading, and at the exits.

- b. Registration and Ticket-Office Area Registration and ticket-office areas are strategic in any convention building; they must be so designed that a large number of people can be processed through one, two, and sometimes three operations. In a

multiple-use building such as the one proposed, it must be possible to separate registration areas for use by two or preferably three simultaneous, separate functions.

Several consecutive operations must be accommodated in the registration area: admission purchases, completion of forms, typing of name cards, and meal arrangements. In addition, there may be one or two information booths, a desk where sightseeing tours are arranged, a post office, and sometimes a special transportation booth.

In view of the nature and variety of functions performed in this area, there should be a number of conveniently located telephone jacks. Usually between 10 and 20 people -- and occasionally as many as 40 -- are employed in registering delegates. In the first day or two of a convention, they may process up to 4000 delegates in one day.

The registration areas should be rectangular; they should total approximately 7500 to 8500 square feet, depending upon the design of the building. They must be planned to handle a high volume of traffic flow.

The number of ticket office wickets depends upon the number of separate entrance lobbies, but should total approximately fifteen

c. Eating Facilities There are three kinds of demand for eating facilities within the convention hall:

- (1.) Extremely large banquets which cannot be accommodated in a hotel.
- (2.) A cafeteria to feed as many as 1000 people per hour
- (3.) Snack-bar facilities serving sandwiches, pastries, coffee, soft drinks, etc.

It would obviously be unwise to construct permanent restaurant or cafeteria facilities that would be required for only a few days each year. In considering the reasonableness of meeting all demands for eating facilities within the convention and exhibition hall, we have surveyed the immediate vicinity of the site. We have found that within a 15 minute walking distance there are, including hotels, about 40 restaurants, 20 cafeterias and 50 lunch counters -- in all, seating approximately 9,000 people. In addition, there will be the new facilities in the Prudential Center, notably in the adjacent hotel. For these reasons, we do not feel that it is necessary or desirable to provide permanent restaurant or cafeteria facilities within the convention building.

Rather, provision should be made for kitchen facilities to be used by a caterer for banquets or special luncheons too large to be accommodated in local hotels. Designed for catering to as many as 5,000 people, they should be readily accessible to the large space on the first floor level and to one part of the under-balcony area.

There should also be provision for lunch-counter concessions within the building. Located in several areas, they could furnish adequate service whether the building was being used for one purpose or was sub-divided for multiple uses. They should be convenient but should not interfere with the efficient layout of booths or the free flow of traffic. Signs or advertisements should not detract from the appearance of an exhibition or the dignity of a meeting.

- d. Service and Office Space In addition to the offices for the building management, there should be shop space for electricians, carpenters, plumbers, painters, and sign painters. For the convenience of the exhibitors, it would be desirable to have an office for these services adjacent to the exhibit space.

At least four offices should be supplied for the convention and exhibition management. At

least one -- equipped with a safe -- should be easily accessible to the registration and ticket-office area. The other offices should be easily accessible to the exhibit areas; at least one should be large enough to accommodate 8 to 10 people, a mimeographing machine, and adequate work areas.

Other spaces and facilities should be available, as follows:

A press room, with about 12 desks
 Checking facilities easily accessible from the lobbies
 An office for a detective agency
 A first-aid room
 A telephone switchboard room
 Public telephones, toilets, and lounge areas conveniently located throughout the building.

The building staff will need locker rooms, storage space for cleaning equipment, janitorial supplies, and concession supplies, and convenient storage areas for temporary seating, temporary floors, and other building equipment.

7. Other Facilities

- a. Air Conditioning Air conditioning is essential to the success of the building.
- b. Lighting Because of the variety of uses possible throughout the building, there should be a very flexible system of illumination, compensating for the variations of natural light (should it be used) and meeting specific requirements of exhibitions, area illumination, spot lighting for meetings, stage lighting, and overall controls for the showing of films. In addition, hanging devices and wiring connections should be provided for special lighting during television broadcasts.

- c. Public Address System There should be a public address system reaching all areas of the building. The loudspeakers should be so located and the control system so designed that sound could be directed to any particular area, according to the way in which the building was sub-divided at any given time. The system should have its own control room, immediately accessible from the convention manager's office. There should also be provision for an amplifying system, for microphones on the stage, and for microphones located throughout the large space on the first level. Similar provisions should be made for the larger meeting rooms on both the first and the second level.
- d. Radio and Television Since radio and television broadcasting from the exhibition hall may be desired, conduit for transmission cables should be incorporated into the building, so that appropriate connections may be possible from the exhibition floor to a broadcast truck at a remote point. Additional conduits should be planned so that closed-circuit television facilities may be made available.
- e. Movie and Slide Projection Room There should be a permanent movie and slide projection room at the rear of the large space, and a disappearing screen on the stage.

There should be a second projection room and screen in the balcony or under-balcony area, for use when the movable partitions create an area seating up to about 500 people.
- f. Stage It is desirable that the stage be approximately 40 feet deep, 80 feet wide, and of proportionate height.
- g. Hanger Inserts So that walls and columns throughout the usable areas will not be defaced, they should have permanent hanger inserts for the purpose of mounting decorations.

- h. Exterior Signs Permanent provision must be made for advance and current announcements of events within the convention and exhibition hall. The provision for mounting them should not detract from the appearance of surrounding areas.

- 8. Parking The demand for parking has several facets. Adequate space is crucial to the success of certain exhibitions and conventions. The heaviest demand comes from the large consumer shows, which may require 1,000 spaces in the daytime and 2500 in the evening.

The situation is less demanding for conventions and trade shows. Out-of-town delegates typically park their cars at their hotels and leave them there. The heaviest demand for parking at these affairs -- particularly for large ones in the evening -- would be created by traffic from the Boston metropolitan area.

The total parking demand created by the convention and exhibition building will fluctuate within very wide limits throughout the year. The heaviest demands are of relatively short duration. Therefore, any parking facility which can supply the total demand of the convention and exhibition hall must necessarily rely upon non-convention and non-exhibition business during the off-peak periods, which are substantial portions of the year.

The existing parking facilities within a reasonable walking distance of the proposed hall are not adequate for the peak demands it will impose. The solution to this problem rests upon the ability of the convention and exhibition hall management to reach policy agreements with Prudential and other prospective owners of commercial facilities in the area. If no solution is found, the lack of parking will seriously hamper the satisfactory use of the building, particularly by consumer exhibitions.

B. DESIRABLE
FACILITIES

Our market survey revealed a demand for certain facilities within a convention and exhibition hall that would be useful but not essential to its function:

1. A speakers' room adjacent to the stage.
2. Dressing rooms and showers in the same area, to be used by exhibitors and convention staffs.
3. A lounge open to men and women, to be restricted to exhibitors.
4. A cocktail lounge for use during some conventions and exhibitions.



